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The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. LIII
No. 1360

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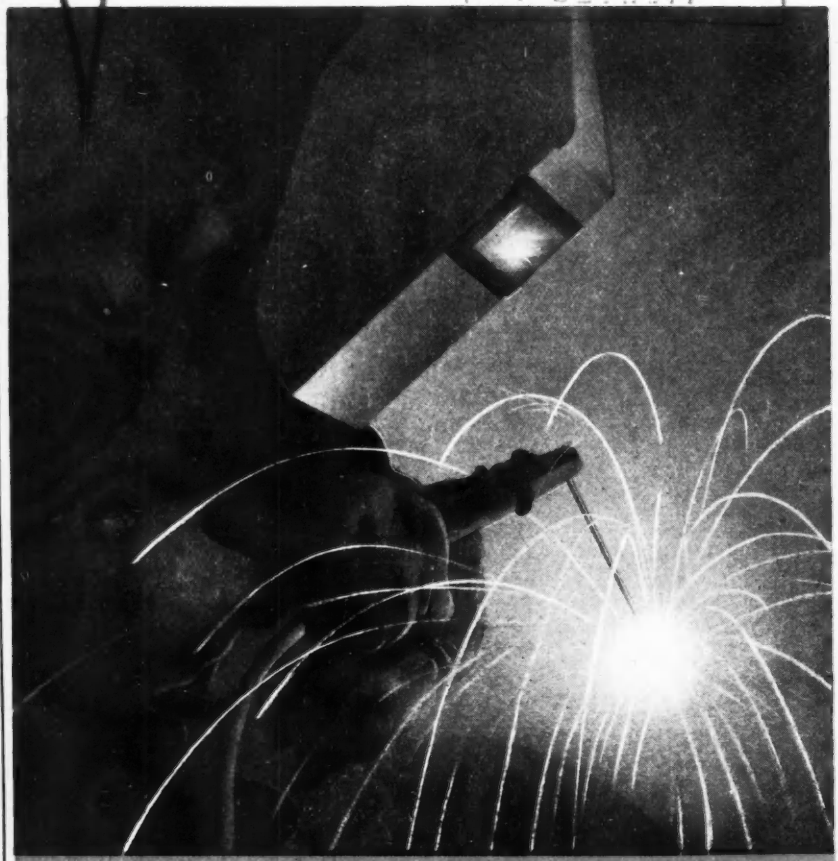

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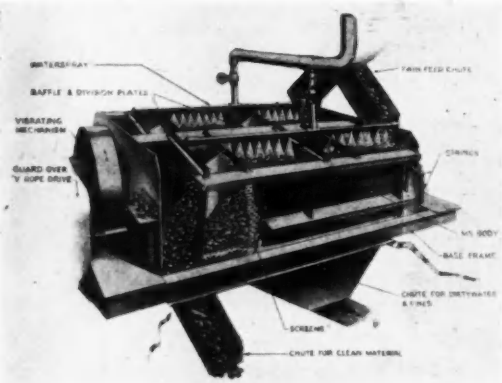

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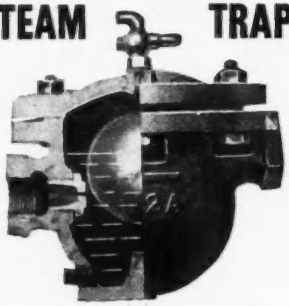

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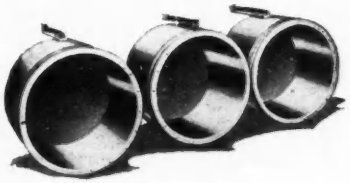

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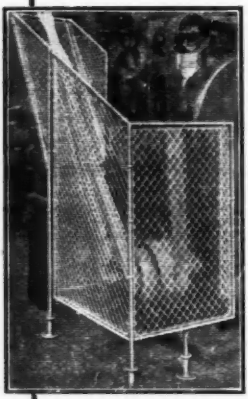

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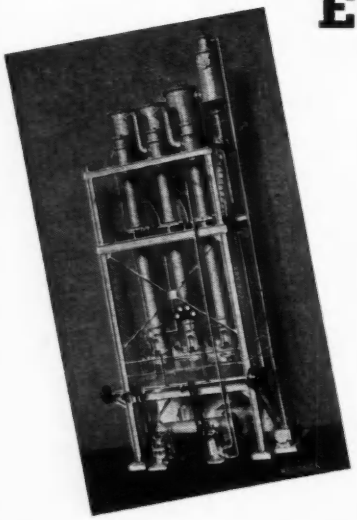

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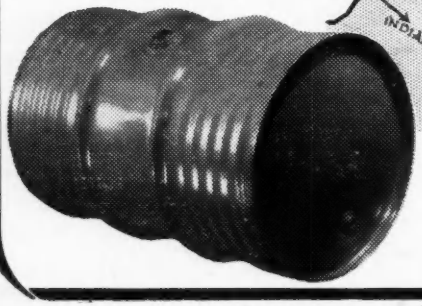

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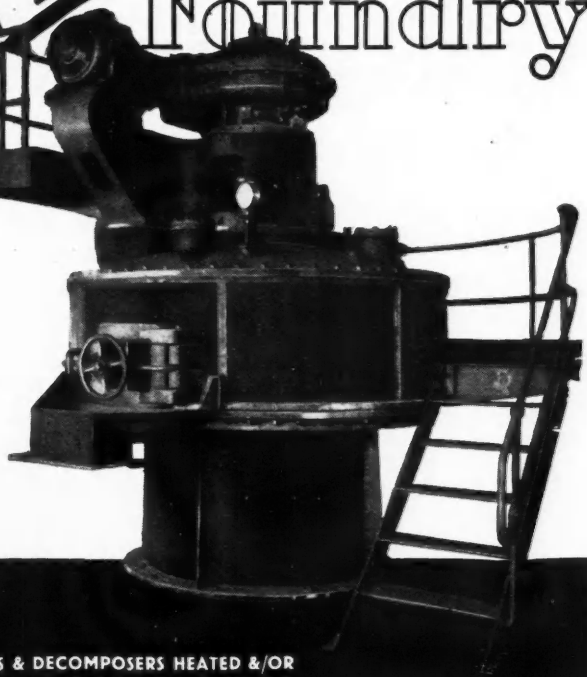

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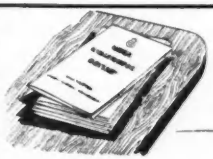
PRACTICAL ECONOMY POINTS FOR INDUSTRIAL GAS USERS (*Bulletin No.* 5). This Bulletin gives two lists of sound and easily followed hints on gas economy: one list is for management, and the other for operators. Planned production coupled with a keen fuel-watching system can produce considerable savings.

OPERATION AND MAINTENANCE OF GAS BURNERS (*Bulletin No.* 14) Every operator of a gas-burning appliance should read and re-read the hints in this Bulletin. Unless he understands the burner and its controls, he may be not only wasting gas and getting bad results, but giving himself a lot of needless trouble into the bargain.

If the recommendations in the Fuel Efficiency Bulletins are followed closely the expectation of gas economies can be based not on hope but on *certainty*. If you need extra copies for your executives or your fuel watchers or your operatives, please write or phone your Regional Office of the Ministry of Fuel and Power.



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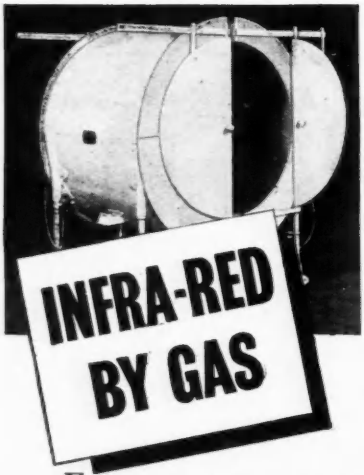

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Further information is contained in a Paper entitled "Infra-Red Drying" by F. L. Atkin, M.I.Mech. E., M.Inst. Gas E.

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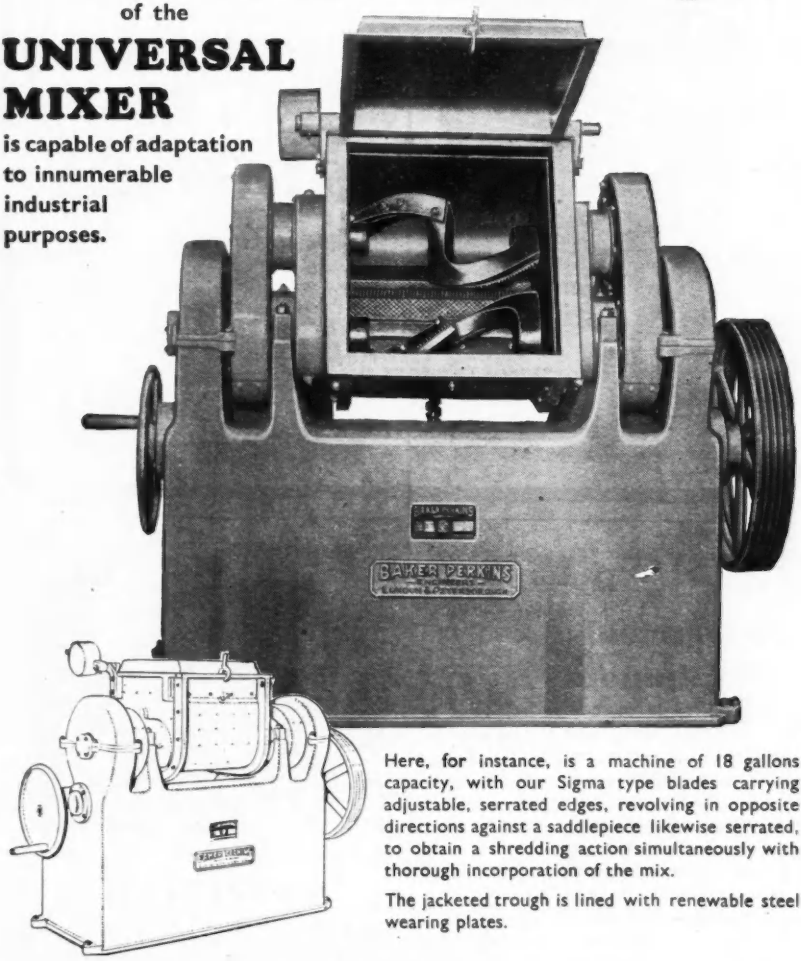

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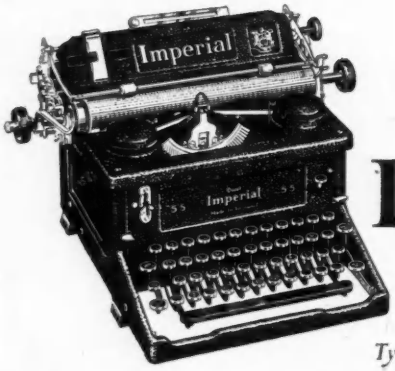

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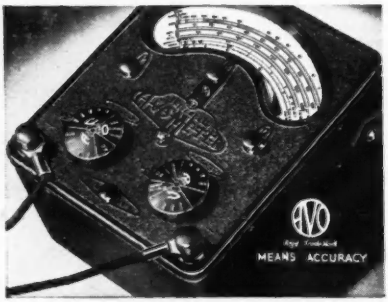

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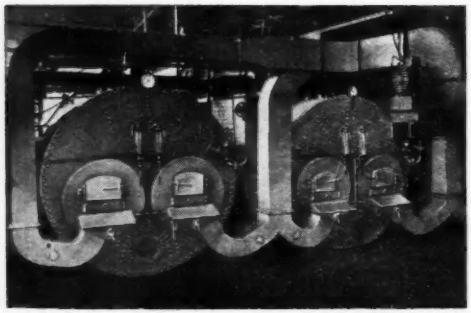

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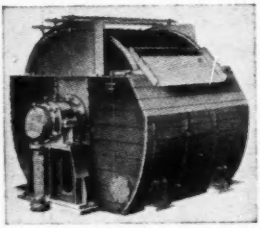

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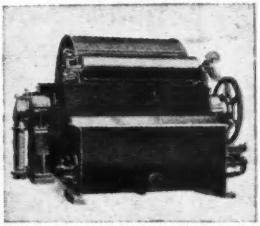

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Germany's War Potential

THERE is little doubt in the minds of those who know the facts that the Allies were thoroughly bamboozled by the Germans after the last war. Leopold Schwarzschild, a former editor of the *Frankfurter Zeitung*, in his book "World in Trance," written nearly two years ago, said: "Germans are characterised by the peculiarity of believing under all circumstances that they have been wronged. They have also a highly developed talent for organising sympathy." Another writer has pointed out that: "With tongues in their cheeks the Germans joyfully signed the League Covenant, the Locarno pact, the Kellogg pact—ultimately a dear little piece of paper specially for Neville Chamberlain—while they trained officers and N.C.O.s as 'privates' in their Free Corps and their 'limited' Reichswehr, got aeroplane factories going in Russia and submarine factories in Spain, had their air pilots practised in the civilian air services of neutral countries and made the welkin ring with appeals for sympathy for their deliberately engineered inflation, the crushing burden of Reparations (out of which they made over 300 million golden pounds), American-ised their factories with an eye to war production, and treated themselves to model workers' dwellings, railway stations, museums, swimming baths, and other luxuries."

The complete text of a statement recently made by Mr. Crowley, Foreign Economic Administrator to the Sub-Committee on War Mobilisation of the U.S. Senate Military Affairs Committee, shows that although Allied bombing was a major element in the defeat of Germany it did not, contrary to belief, reduce most German plants to utter ruin. While it disrupted the flow of raw materials and supplies, comparatively few plants were destroyed and for the most part the most important plants could go into operation within a very short time after very little repair. Germany's war potential is therefore temporarily impaired, but the period of impairment is very short.

Some items of information from this report are worth quoting because they drive home these facts in a way which should prevent us from being again misled. Although Germany is less than four times the size of New York State and has only five times the population of that State, one dye-

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making plant alone in Germany can turn out as much dye in a year as all the plants in the U.S.A. together. That plant has not even a broken window to-day. During the first world war it was the key unit in the production of poison gas. During this second war it has turned out great quantities of explosives, using for that purpose the plant which is still intact.

Practically all the great iron and steel furnaces of Germany are ready for operation or can be put into operation with minor repairs. Germany, which produced only 3 million tons of steel in 1932, including that used to manufacture goods for export, made more than 19 million tons in 1938 and at that time had a capacity of 25 million tons. The British production of semi-finished steel up to the outbreak of war was less than 10 million tons a year. Germany could not utilise a capacity of 25 million tons except for warfare, and the continued existence of such a capacity is an invitation to war.

In 1936-37 the world output of chemical nitrogen was some 2,600,000 metric tons. Germany was producing a million metric tons in 1939 and has a potential of at least 1,600,000 tons. More than 28 per cent. of the contents of every bomb consisted of chemical nitrogen from the atmosphere. A large part of this capacity remains or can be rebuilt in a short time.

Germany's coke ovens produced 2,228,000 tons of coal tar in 1937, only 115,000 tons less than the ovens of the U.S.A. In 1939 Germany imported 60,500 metric tons of rubber; the general synthetic rubber capacity to-day is believed to be more than 100,000 tons. In 1934 Germany was consuming less than 4,000,000 tons of petroleum products, of which total approximately 300,000 tons were supplied by natural petroleum found in Germany. In 1935, Germany manufactured about 200,000 tons of synthetic oil. Nine years later, in 1944, Germany was producing about 1,000,000 tons of natural petroleum and about 5,500,000 tons of synthetic oil within the borders of Germany as she stood in 1938 before Hitler began to annex other parts of Europe. By the time the war ended in 1945, Allied bombing had done great damage to Germany's natural petroleum and synthetic oil production, but it is believed that a large part of Germany's 1944 capacity for petroleum products can be restored within a brief period.

So the story develops. In one industry after another there is the same tale to tell. Germany immensely expanded her potential war industries, partly during the years preceding the outbreak of war and partly during the war period. The Germans cannot use this vast capacity for peace and if they are allowed to retain it they are already prepared for war. The position is even more desperate in regard to machine tools. Modern war depends on machine tools and on instruments. With only about half the population of the U.S.A., the German machine-tool building capacity in 1939 was larger than that of the U.S.A., even though the civilian economy of our Ally was much more highly mechanised than that of Germany. Mr. Crowley points out in his report that: "As it stands to-day, Germany, except for the U.S.A., is the outstanding armament machine shop in the world."

In addition to what is available within Germany, it must never be forgotten that the economic activities of Germans outside Germany have always constituted one of the most important bases of German aggression, and unless we are prepared to prevent it this will be the first step that Germany will take towards the third world war. Among the methods used are long-term investments in industrial plants, banks, mines and enterprises of every type in foreign countries; stocks of merchandise or raw materials, frequently in neutral countries from where they could be shipped to Germany; art objects, gold and wealth of tangible character which could be used to purchase goods and which have been taken out of the country in order to avoid contributing to reparations.

A detailed review of the activities of Germany before the war and the way in which a great war machine was built up which could use all the resources of the world to make war upon the world reveals how difficult will be the task of eliminating or controlling the German capacity to make war. Controlled, however, it must be. Whatever is done must be thorough and it must be lasting in concept and character; it must prevent a recurrence of the overwhelming

German economic domination of Europe. We cannot destroy German trade, however, and leave the Germans no livelihood; we must therefore recognise the difference between normal trading and domination for war purposes. The measures we must take may require a variety of means to implement them: they must be flexible so that they can change as changing circumstances demand, they must be realistic and detailed. In Mr. Crowley's view they should be the springboard of a peaceful agricultural and industrial future for Germany and they should be consistent with the ambition of Europe to regain a desirable economic and industrial development.

This is the greatest political problem of our time. But it is more than a political problem. It is also a technical one. German world domination has been increasingly based upon technical and scientific factors and upon insidious domination of business through a policy of "peaceful penetration." The facts should be published as widely as possible in order that our business men and our technical men, no less than the politicians and statesmen, shall be on their guard in making arrangements with Germany and in giving Germany information or preferential treatment of any sort. Science is international, technology is international, business is international. And so it should be. But when one nation has so evidently used its international contacts for anti-social purposes it is time to make exceptions.

NOTES AND COMMENTS

Research Secretariat

SOME time in the late autumn, or early next spring, it is announced, the Federation of British Industries is to convene a two-day conference on Industry and Research. Meanwhile, the F.B.I. is engaged in building up an organisation to deal with the questions involved in such a project. As a start, they have formed a Research Secretariat and have appointed, as its head, Dr. B. J. A. Bard, who is both a scientist and a barrister, and concerning whom particulars will be found in a later column of this issue. Dr. W. T. Griffiths, F.R.I.C., a member of the Federation's industrial research committee (speaking for Sir William Larke, the chairman, who is recovering from illness), said that the duties of the Research Secretariat would include fostering industrial and national interest in research, maintaining contact with industrial research organisations, and providing a service of advice and information. It goes without saying that closest touch is maintained with the D.S.I.R., which is represented on the research committee by Sir Frank Smith. One of the first tasks of the Secretariat, Dr. Griffiths said, would be to conduct a survey of existing research facilities, while lectures would be arranged and articles prepared. There is a feeling among the committee, which we ourselves share, that many industrialists who are quite willing to carry out research neither understand all that it involved, nor have the necessary staff and facilities. Little extension can be done at the moment, it is realised, but there is no harm in telling people how it can be managed when the opportunity does come. That is one way, and a good way, of avoiding the time-lag that so often afflicts us, coming between research and its development.

World Science Links

ANY amount of criticism, some of it no doubt well deserved, has been levelled at the British Council during the ten years of its existence. To preserve the balance of strict justice, it is worth while to examine the progress of the Council's efforts to promote contacts between British and foreign scientists, especially since the establishment of its Science Department four years ago. A summary of these activities has been published on the occasion of the Council's tenth anniversary this month. *Monthly Science News*, the Council's four-page illustrated newsletter, which has editions in French, Spanish, Portuguese, and Arabic, now has a circulation of 65,000. Its articles are described as being "presented in a form intelligible to non-scientific readers." *Science Comment*, on the other hand (founded

in 1943), is a monthly compilation of abstracts and reviews, circulated to universities, libraries, and scientists overseas in order to keep them informed of important British publications in the scientific and technical field. Occasional copies of these periodicals have come our way, but it is difficult to assess their value without a more detailed study. Our own impression is that, though praiseworthy, they are still inadequate, but, of course, we are not conversant with the relations between their editors and the Paper Controller. At all events, we gather that any leeway is to be made up by means of more extensive publication in the future.

Personal Contacts

OF acknowledged advantage have been the overseas visits of eminent scientists; while the work of Dr. Joseph Needham and his team in China has been quite outstanding. The Council claims to have been instrumental in establishing useful contacts with scientists in the U.S.S.R.; and if the reception which the recent scientific delegation met with in Russia is in any way due to this, the Council is certainly to be congratulated. The converse of these activities includes the foundation of the Society for Visiting Scientists, with its pleasant London premises; and the establishment of scholarships to enable students to work in the United Kngdom, as well as short-leave courses for Dominion and U.S. Forces. The cost of all this is not stated, but when a balance is drawn, it will be seen that there are some important items to reckon with on the credit side.

Science in Scandinavia

WHILE certain sections of the popular Press are hammering away at the old tune of the superiority of German science, which nevertheless was unable to win them the war, we are glad to learn that the Royal Society is taking up a rather more realistic attitude. The scientific correspondent of *The Times* has provided an illuminating account of the visit to Denmark and Norway paid by Professor A. V. Hill, the energetic and much-travelled secretary of the Royal Society. His visit was not merely a gesture of good will; it had the practical objective of distributing to the hard-hit laboratories and scientific institutions, of Norway in particular, scientific literature and money for the purchase of instruments (this latter from a fund established in memory of Sir Horace Darwin), and to make an appeal, for both Norway and Denmark, for a supply of English scientific literature. Actually, the Danes only felt the full weight of Nazi destructiveness for about two years (for reasons which we have detailed elsewhere), but in Norway the scientific institutions were stripped to the bone. We have quite recently published articles on the position of the chemical industry in Norway and in Denmark, and have made reference to the achievements of their chemists in the past. Our reputation as a nation is higher in those countries to-day than it has been at any time in history. Let us not again be misled by propaganda, but let us rather co-operate with those whom we know to be our friends and whose achievements stand on a sure foundation. Here is a golden opportunity for confirming a position already strong and for forging new scientific links, both academic and industrial.

Promotions at the A.B.C.M.

INDUSTRIAL chemists all over the country will be glad to welcome Mr. Davidson Pratt back to his seat of office at the A.B.C.M., after his five years of valuable service to the State. Probably nobody is better pleased to see his re-entry into the councils of the chemical manufacturers than Mr. Murdin Drake and Mr. Allan Holden, who have so ably been holding the fort in his absence. We are happy to be able to record elsewhere in this issue that both Mr. Pratt's Government service and the unremitting energy of his two colleagues, under the harassing conditions of war, have been appositely rewarded by the Association, the former receiving the title of Director of the Association, while Mr. Drake and Mr. Holden become Joint Managers. With so efficient a team in charge of its affairs, the A.B.C.M. should be in a position to make exceptionally rapid headway; and its members can look forward to a gradual resumption, as conditions more nearly approach the normal, of all the services that the Association so amply provided in times of peace.

Society of Chemical Industry

Professor Rideal's Address

IN his presidential address, delivered at the 64th annual general meeting of the Society of Chemical Industry held in London at the Royal Institution on July 13, Professor E. K. Rideal said that he had read past presidential speeches delivered before the Society with feelings of great dismay, on account of the description of the attempts and failures to obtain a Chemistry House or the concept of a Chemical Council which would embrace the whole of our chemical interests. In many quarters there was a good deal of misapprehension about the Society's nature; this has now been removed and it seems possible that closer collaboration with the Chemical Society in many directions was now possible. Part of this misapprehension was due to the name of the Society and a certain lack of appreciation of what modern technological research and development in chemistry really means. It is true that the title "Society of Chemical Industry" is a misnomer and there was a strong case for considering the possibility of a change to a more descriptive title such as the "Society of Applied Chemistry."

Chemistry House Needed

Both from the national point of view as well as for international reasons it was a matter of great urgency that our chemical fraternities become more consolidated. This desire for the rapid construction of a Chemistry House whether or no in what may be a "Science Centre" was no mere whim of a few scientists, but was, or should be, a matter of national prestige in the recognition that the position of this country both as an intellectual as well as an economic entity would in the future become more and more dependent on the success or otherwise of the chemical processes to which we subject the three empire foundation stones, coal, oil, and carbohydrates. Our continental friends were expecting us to take action.

As pointed out by Lord Samuel several years ago, the scientific structure of our State is being built around the Lord President in Council. Professor Rideal noted the development of the Medical Research Council, the Department of Scientific and Industrial Research and the more recent Agricultural Research Council, and said that it was evident from the proceedings of the Parliamentary and Scientific Committee that Parliament and the Government were requiring, and would require, an increasing amount of scientific information, but the Lord President in Council had as yet no Chemical Research Council. It was true that certain parts of our science were dealt with in part by the three advisory bodies *in esse*, but the Lord President had to go elsewhere for vast tracts of chemistry, both pure and technological, which did not lie within the mandates of these bodies. If such a Chemical Research Council should ever be instituted, it must contain representation of our chemical manufacturers, of our chemical research organisations both pure and applied. It may well emerge from the Chemical Council in which the Society of Chemical Industry plays an active part.

Technological Research Lacking

Turning to the subject of research in this country, Professor Rideal said that to effect an increase in research we must begin earlier in our educational scheme and develop to a greater extent those cultural aspects which were at present latent in science. Chemical research was a curious plant and would only flourish in certain soils and atmospheres. In our universities we had, in addition to research, other functions to fulfil, namely that of education, and there was a continuous flow-through of the younger generation. These keep the spirit alive and the mobility of senior workers from one university to another was a state of affairs to be encouraged. At the same time the universities had their difficulties. Overmuch teaching on the one hand, or too much time which on paper is devoted to research without other interests were both to be deplored. By and large, our universities were not completing the training required for modern chemical technology. This was partly due to the fact that a longer course was required in this subject than in any other academic branch of chemistry. Two or three post-graduate years of research in an enlightened university laboratory were the best we could offer at present. Pilot plant work, if done at all, must be done well and he would suggest that it might be possible to convert some existing Government experimental station, *e.g.*, Sutton Oaks, into an organisation which might offer such a two-year post-graduate course in chemical engineering, the entrants being graduates with honours in physical or organic chemistry, physics or engineering from a number of our universities. The candidate acquitting himself in this post-graduate work might even obtain a diploma in chemical engineering from his own university.

In industry there was likewise a continuous, but in some cases slower, change of personnel and in any case there is the flow-through of products. One of the major faults of industry was that between the production on the one hand and the research

laboratory on the other, there was in general too great a contact. There should be a screen in the form of control and testing laboratories to deal with passing events. This screen, however, should never be completely impermeable so that the research laboratory feels isolated. The proposition had frequently been put to him that universities should no longer do research but merely teach; industry with its ever-growing facilities, should be the right home for research, but he could not agree with this thesis. There are several aspects of research which find no place in industrial work. The true spirit of inquiry is frequently highly individualistic and in its operation must not be confined within an organised cage. "The wind bloweth whithersoever it listeth, but who can tell the way of the spirit?"

Dangers of Team Work

In universities, a modern concept of "putting in a team" to deal with some branch of a subject is beginning to arise, fostered chiefly by administrative bodies simply because it was a simple problem to "administer" such a team. This rationalisation of research was one of the most dangerous of modern developments. The pioneer was an individual and any team he had should be one which had grown on to him by those who felt attracted by his methods and ideas. This somewhat quaint and patriarchal idea was fading from the world. Under modern

Professor E. K. Rideal, Chairman of the Society of Chemical Industry.

conditions, it was practically only in universities where this concept of freedom to follow one's own bent persisted, although the barriers to intellectual freedom in many modern industrial research organisations were environmental and mental rather than factual, but they were nevertheless real.

Government departments in general, as well as isolated research departments, were still less fortunately placed. In such organisations the personnel rapidly becomes static and stimulation from external sources feeble, or in the case of service departments, practically absent. A complete secrecy blanket must eventually smother any initiative and originality. Many variants and combinations have been experimented with in different countries, but the ideal solution still awaits discovery. Frequent attendance at, and participation in all kinds of scientific meetings, rapid and prompt appreciation of originality and increased fluidity in movement from one department to another, from research to executive and *vice versa*, preserving secrecy only in essentials, were, he concluded, all important.

Non-Chemical Directorates

Lastly, looking to the growth of chemical industry during the last century, especially in relationship to our society, the speaker noted some rather depressing tendencies. In the early days a chemical plant was owned and operated by a practising chemist. Indeed, it was these practising industrial chemists who founded the Society. As the industry grew, for a short period the practising chemist owner was assisted by other chemists. Later, however, the financial implications of the industry began to become important and the concepts of "manager" and "administrator" began to appear on the horizon. In this country, the pendulum has swung so far that we find many chemical industries in which the directorate is practically divorced from the practising chemists in the industry, whether on the plant or in the research laboratories. We should learn from the experience of the American and German chemical industries that this lack of representation of the practising chemist at the director's table means the decline and eventual death of the industry. It is, however, a hopeful sign that some of our more progressive industries are alive to this national danger and the chemist is again appearing with the financier and the administrator on the directorate.

Medallist's Address

Lord Leverhulme, on whom the award of the Society's Medal was conferred, dealt in his address with "Research in Prospect and Retrospect." He pointed out that research considered as a national problem, presented three factors—Government, the universities, and industry; and only by co-operation and understanding could progress be made. Dealing with expenditure for research work, he said it was not like a penny machine where you could get a bar of chocolate (though in reply to a question by the seconder of the vote of thanks, he was unable to disclose the exact location of this machine), but it resembled the fruit machine, where a large sum or nothing at all could be drawn.

Continuing, he said that he could not believe that control, direction, or planning by

the State of all the activities of scientific inquiry would produce the best results and make for progress. "A passion for what they call a tidy picture and the prevention at all costs of overlapping persuades some people to see in a national research blueprint a perfect solution of the problem. Better that two or a dozen investigators should be searching for the answer to a question than that from fear of overlapping the answer should be missed."

"In the sphere of Government we need, apart from the whole-time scientists working in Government laboratories, a leavening of scientists in public affairs. The Government should contain a Minister who will have a special concern with scientific matters."

Lord Leverhulme, the Society of Chemical Industry's Medallist for 1945.

LETTERS TO THE EDITOR

Social Security for Chemists

SIR,—In your leading article of July 7, which dealt with Mr. McLachlan's address to the London Section of the British Association of Chemists, you suggest that the Association should explore the possibilities of developing a scheme for social security among chemists. You will be interested to hear that at the meeting of the London Section Committee on July 4 it was agreed to hold an open meeting on September 19 to discuss "Social Security for Chemists." At that meeting every chemist will be welcome. I hope to have the privilege of opening the discussion and it is my intention to put forward proposals which, if accepted by the profession and loyally supported by every member, would, I am certain, gradually do away with many difficulties which have caused the chemical profession to be a Cinderella among the learned professions.

It is very clear that chemists, if they are to achieve the higher scales of remuneration which their work should justify, must be prepared to co-operate with their fellows. Each should resolutely refuse to accept any job which does not offer an adequate salary, and the B.A.C. should be the organisation which assists him to be independent. Even to-day a B.A.C. member may receive up to £5 a week if out of work, but that figure should be substantially increased. More chemists should be willing to be paid by results and more effort should be made to demonstrate the financial value of the work of the chemist to the industry he serves or to the students whom he may teach. Too many chemists who secure good jobs think that they need not worry any more and are not prepared to join in any scheme of mutual assistance. They fail to realise that by assisting the younger members to achieve a higher standard of living they will automatically raise their own status. Quite recently a member of the B.A.C. wrote resigning because he had been made a director of a company. Surely, it is of the greatest importance to the chemical profession that chemists should be encouraged to seek the highest positions in industry and, having done so, that they should remain in such an organisation as the B.A.C. in order to advise and assist their fellow members.

During the next few years I hope to see a great increase in the membership of the B.A.C. so that the Association may serve the profession as a whole instead of a small section. At the meeting on September 19 I hope to provoke a lively discussion and I hope that there will be a big attendance of chemists from academic circles as well as from industry.—Yours faithfully,

NORMAN SHELDON,
Hon. Sec., London Section, B.A.C.

Inventions of Employees

SIR,—With reference to my article on "Inventions of Employees" which you published in your issue of June 30, 1945, I wish to say that a full translation of the pertinent Sections of the Patents Act, 1925, of the Austrian Republic has been published in the meantime in my article on "Master and Servant" in the American *Journal of the Patent Office Society* (May, 1945) which also contains an article by Dr. Paul Abel on "The Employed Inventor in Austrian and Czechoslovakian Law."—Yours faithfully,

S. MITTLER.

Pre-war sales of laboratory glassware in Sweden amounted to 100,000 kronor per annum. While Germany supplied most of her requirements, Sweden is now interested in special resistance glass from the United States. Recent Swedish experiments to produce glass for high-vacuum tubes have been successful.

Swan Committee's Report

Desirable Changes in the Patents Acts

by S. MITTLER, A.F.R.Ae.S., A.M.I.Mech.E.

THE President of the Board of Trade has recently presented to Parliament the First Interim Report of the Departmental Committee, Patents and Designs Act.* This report is confined to the modification of the procedure under which applications are at present made for extension of term of patents in cases where the patentee as such has suffered loss or damage as a result of the war.

The existing procedure, as regulated by subsections (6) and (7) of Section 18 of the Patents and Designs Acts, 1907 to 1942, and by Rules of the Supreme Court, Order 53A, Rule 4, permits application to be made for the extension of the term of a patent shortly before the expiry of the patent or, in certain circumstances, even after the date of expiry. The procedure is complicated and expensive, however, and results in average costs of from £150 to £200 in unopposed cases, an amount which may be considerably exceeded in contested cases.

Summary of Present Procedure

The present procedure may be summed up briefly as follows: The patentee has to make his application by way of an originating summons naming the Comptroller of Patents as respondent and having it served on the solicitor to the Board of Trade. The summons must be accompanied by evidence and affidavit with the object of proving applicant's war loss as a patentee. On return of the summons, directions are given by the Judge or Master in Chambers as to the advertisement of the application, which then is, accordingly, open to opposition. Actually, only one out of 150 applications dealt with so far in this war has been opposed.

The solicitor to the Board of Trade refers the case to the Comptroller of Patents who, in his capacity as custodian of the public interest in patent matters, submits all the documents to a close examination, as a result of which he indicates his views as to the amount of extension, if any, justified by the evidence. His observations are communicated to the solicitor to the Board of Trade, and such of them as point to irregularity in respect of the application, or obscurity or insufficiency in respect of the evidence, are communicated in turn by the Board of Trade solicitor to the solicitor for the applicant. Any reply received is, in turn, transmitted to the Comptroller, who advises on the answer to be sent.

Eventually a hearing is held in court, when the applicant may appear in person, but is in most cases represented by counsel. The Comptroller appears at the hearing in the public interest, and is represented by counsel instructed by the solicitor to the Board of Trade. The applicant's costs, where there is no opposition, are thus the costs of his own solicitor and counsel, and the costs of the Board of Trade solicitor and counsel instructed by him.

Modifications

The Committee was unanimously in favour of a modification of the existing practice. In particular the Committee recommended:

1 (unanimously). That the Rules Committee of the Supreme Court be invited to modify the rules referring to the advertisement of application for such extension so as to make it obligatory *only to advertise in the Official Journal (Patents)*. This recommendation would not require legislation.

2 (with two members dissenting). *That jurisdiction be given to the Comptroller* so that the patentee may apply at his option to the Comptroller or to the Court with the right to appeal from a decision of the Comptroller.

The application to the Comptroller should be made on a stamped form at a very moderate fee, of say £3, which should cover also the costs of advertising in the *Official Journal (Patents)*.

In straightforward cases when the Comptroller is satisfied with the case presented to him upon the evidence, and in the absence of any opposition by third parties, the Comptroller would make an Order extending the patent. In other cases, when the Comptroller has raised objection to the application, the applicant would be entitled to appear in person in support of his case or to be represented by his patent agent or solicitor, thus cutting out the costs for the Board of Trade solicitor and for two counsel.

The Comptroller would have to give consideration to all circumstances of the case, including profits from foreign patents, on the lines of existing judicial pronouncements upon these matters. An applicant who is dissatisfied with any decision of the Comptroller should have the right of appeal to the Patents Appeal Tribunal.

On the other hand, the Comptroller should, at his own discretion, be entitled to refer to the Court for decision any application for extension of term which appeared

* H.M. Stationery Office, Cmd. 6618, April, 1945.

to him to raise issues of a type that could be more fittingly decided by the High Court.

Suggestion had been made to the Committee to extend automatically all patents for a term equivalent to the period of the war, but this has been rejected as unsatisfactory. Another suggestion, to afford to a licensee equal rights to apply for extension, was likewise not recommended.

The acceptance of the recommendations of the Committee would relieve patentees of costs which hitherto have been prohibitive to many of them, a state of affairs almost amounting to denial of justice to a large body of persons who had already suffered loss or damage on account of the war. This is the more important as losses and damages cannot yet be fully assessed, so that the procedure might have to be repeated in order to allow extensions, under the present Section 18, to aggregate up to, but not to exceed, a total of ten years.

Industrial Safety Gleanings

Labelling Dangerous Chemicals—Sand-Blasting

THE first comprehensive effort to systematise and standardise the labelling of hazardous chemicals has just been completed after a year's work by a special committee of the Manufacturing' Chemists' Association of the United States, 608 Woodward Building, Washington, D.C. The results of this work are published in the form of a manual entitled "A Guide for the Preparation of Warning Labels for Hazardous Chemicals."

A principal objective of the work is to discourage dependence upon code labels, which leave the user with no information about the product. The manual outlines the principles that should govern preparation of precautionary labels, with maximum emphasis on protecting the users, packers, jobbers, and distributors of chemical products, or others who may be less familiar with them than the manufacturers.

The manual includes detailed definitions of terminology and a classification of hazards, offers recommendations for label cautions to be used with each hazard, suggests labels for experimental samples, and gives specimen labels to show how the principles should be applied. These principles are being adopted by the leading U.S. chemical manufacturers. The resulting standardisation, it is expected, will lead to a more exact understanding of terminology and specific hazards.

At the same time the Association has published a companion manual, which contains label cautions for approximately 70 representative chemical products, the precautionary measures for which are based on the principles developed by the special committee.

Principles of Labelling

The following principles should first be considered in the preparation of any precautionary label: (1) Each chemical product presents a distinct problem and must be treated individually, in the light of its own characteristics. (2) Extreme care should be exercised in the choice of terminology. Statements should be brief and simple. (3) On labels for different products, uniformity in language to indicate the same hazards is most desirable, for standardisation purposes. (4) Precautionary statements must be accurate and selectively chosen. To be effective, they should be used only when necessary as indiscriminate use will tend to destroy their value. (5) Chemical names should be those recommended by the American Chemical Society. (6) The use of a non-descriptive trade name as the only identification of a hazardous chemical should be avoided. If the chemical name is so complex as to be meaningless except to the trained chemist, the label should state the type of chemical, *e.g.*, "corrosive acid," "lead compound". (7) The following should be included on a precautionary label: (a) chemical name, (b) "signal word" (*Danger—Warning—Caution*) designating degree of hazard, (c) affirmative statement of "hazard", (d) "precautionary measures" covering actions to be followed or avoided.

The committee notes that individual regulations may require particular information to be included on a label or a specific label to be affixed to a container.

Classification of Dangers

The classification of hazards adopted is as follows: (1) Inflammable liquids and oxidising agents which support combustion (a) flash point 20° F. or below; (b) flash point above 20° to 80° F. inclusive; (c) flash point above 80° F.; (2) inflammable solids and oxidising agents; (3) vapours immediately toxic or extremely irritating, even on exposure for a short time, or to low concentrations; (4) vapours hazardous from prolonged or repeated exposures or from exposure to higher concentrations; (5) vapours physiologically inert; (6) harmful dusts; (7) skin irritants (corrosive); (8) materials causing skin irritations after repeated or continued control; (9) materials toxic through vapour inhalations or skin absorption; (10) materials toxic if taken in-

ternally, including materials covered by statutory definition of poison liable to be destructive of human adults in doses of 4 gms. or less, or any material toxic in amounts likely to be taken internally in error.

Butanone and Acetone Hazards

Reports are given in *Indust. Bull.*, 1944, *23*, 174-176 (through *J. Text. Inst.*, 1945, *36*, A283) of two cases of acute intoxication due to exposure to butanone and acetone simultaneously in waterproofing the seams of raincoats. Two Vinylite resins were being applied by brushing, one dissolved in acetone and the other in butanone. Two brushings were given with acetone as the solvent and one with butanone as the solvent, allowing two hours to elapse between the brushings. No precautions were taken to remove the fumes. Air tests disclosed concentrations of butanone ranging from 398 to 561 p.p.m. and of acetone from 330 to 495 p.p.m. The first patient complained of gastric distress one morning and was removed to hospital in a coma that afternoon. She recovered rapidly and was discharged two days later. The second fainted while at work; the fainting was followed by a convulsion; a few hours later she had recovered and was allowed to go home. No precautions were taken against fire, though large numbers of garments were hung up to dry and produced an inflammable mixture in the air. At another plant doing similar work symptoms of low-grade intoxication were detected and also dermatitis from exposure to butanone; several workers developed numbness in the shoulders or legs. The exposure here was to butanone alone, in concentrations ranging from 300 to 600 p.p.m.

Sand-Blasting Regulations

For many years attention has been drawn in the Annual Reports off the Chief Inspector of Factories to the grave risk of contracting silicosis incurred by persons engaged in or in connection with "sand-blasting." In 1932-1941, 114 certificates of death, disablement and suspension on account of the disease were issued for "sand-blasters" engaged in the processes to which the Silicosis Compensation Scheme applied. Moreover, the Factory Department has records of other fatal cases among sand-blasters in various industries. These totals are not in themselves large, and it might seem at first sight that the occupation is relatively safe when comparison is made in other silicosis-producing industries. Medical and other investigations have, however, shown that the figures are small only because relatively few persons are engaged in the process, and that the risk in "sand-blasting" is, in fact, extremely high.

The risk has been removed or reduced in a number of cases by the use of non-siliceous abrasives (*e.g.*, metal shot, metal grit, or aluminous grit) in the "blasting" apparatus and by other precautions; but the figures quoted above indicate that such measures need to be extended and improved upon and the matter has been more thoroughly gone into by a Joint Committee on Dust in Steel Foundries, this being a class of works in which "blasting" is done to an extent which has afforded valuable practical guidance as to the use of non-siliceous abrasives and as to the efficiency and weaknesses of various precautions. The Committee has now recommended (i) that the use of siliceous abrasives in "blasting" apparatus should be prohibited, and (ii) that more elaborate precautions should be required in the cleaning of castings. In the case of that process the silicosis risk would not be removed merely by using a non-siliceous abrasive in the blasting apparatus.

In the light of these recommendations the Minister of Labour proposes to make Special Regulations under the Factories Act 1937, for factories in which "blasting" is done, and is giving statutory notice in the *London Gazette* that any objections should be lodged on or before July 24, 1945.

Wearing of gas masks by persons working in factory blasting chambers, to combat the high risk of contracting silicosis, is among other special regulations which the Minister of Labour is proposing to make; and no persons under 18 may be employed where they would be exposed to the risk of silicosis.

War Against Eye Injuries

To aid in furthering eye protection of industrial workers, a research programme has been initiated at Battelle Memorial Institute, Columbus, Ohio, under the sponsorship of the American Society of Safety Engineers, Engineering Section of the National Safety Council. To involve a year of investigation, the programme is intended to provide information to combat the 75,000 disabling eye injuries and several hundred thousand non-disabling injuries that occur annually in American industry. It will apply particularly to evaluation of performance requirements and specifications of plastic eye protectors, and will include both laboratory and statistical investigations.

At Glen Davis, New South Wales, approximately 2,500,000 gallons of petrol are being produced annually at a cost of about 3s. 6d. per gallon. After completion of the present construction programme, scheduled early next year, a production of 9,000,000 to 10,000,000 gallons at a cost of 1s. per gallon is being anticipated. Large-scale shale-oil development at Baerami should be delayed until further experience had been gained at Glen Davis, the Parliamentary Standing Committee recommended.

South African Chemicals

Important Advances Reported

(From our South African Correspondent)

SINCE the importance of food yeast as a nutritional factor was discussed in THE CHEMICAL AGE of May 5 (p. 395), interesting details have come to hand about developments in that field in South Africa. A company called the Food Yeast Development Company (Proprietary), Ltd., was registered in February with an initial capital of £20,000, to be subscribed equally by the Industrial Development Corporation of South Africa and the South African Sugar Association. The objects of this new venture are to carry the food yeast production process through the semi-commercial stage, to explore markets, and to formulate plans for full-scale commercial production.

Food Yeast Development

After production of food yeast on a pilot-plant scale was successfully accomplished at Durban in July last, the Industrial Development Corporation arranged for the erection of a semi-commercial plant in the premises of Natal Cane By-Products, Ltd., Merebank, Durban. It is expected that the sugar industry will co-operate in further development work.

German and Swedish experience and the report that a plant with a capacity of 4000 tons per annum was planned in Jamaica have stimulated interest in the Union. It is considered essential to approach commercial production in stages, and to provide a sufficient quantity of food yeast for nutrition tests before embarking on full-scale production. The semi-commercial plant is now being fabricated, the stainless steel sheet and tubing required being made in the Union. Food yeast manufactured from molasses contains about 50 per cent. protein, but its chief value lies in its high content of the B-vitamins, which are lacking in the diet of large sections of the Union's population. The potentiality of the project can be gauged from the fact that an output of 20,000 tons will be possible in an average year in South Africa without interfering with the existing commercial use of molasses, apart from the quantities ordinarily exported.

A plan for a "central service station" for the South African chemical industry was outlined by Professor F. L. Warren, who was recently appointed Government industrial chemical adviser, at a luncheon given in Johannesburg by the Transvaal Chemical Manufacturers' Association. He said that the station would advise, but not interfere with, private industry. It would have a staff of experts, and would provide library and laboratory facilities to aid industries in keeping abreast of current scientific information and in carrying out research projects. It would assist industry in the disposal and utilisation of waste products and bring the finest brains to bear on the problems of individual industries. He emphasised that the plan was still in the embryonic stage, but said the station would later become part of a larger organisation.

Industrial Chemical Products of South Africa (Pty.), Ltd., have purchased 224 acres of ground at Lilianfield, Germiston, Transvaal, with the intention of building factory premises. It is understood that the new plant will be one of the biggest in the southern hemisphere and that as soon as permits for building material and industrial machinery are granted construction will begin. Many new products will be added to the present range.

K.T.C. (Pty.), Ltd., 6 Thorpe Street, Johannesburg, are making soldering outfits which, it is claimed, dispense with the necessity of cleaning, flux, or soldering irons. The outfits are packed in cardboard containers, together with solder heaters and powdered solder.

Industrial Equipment

Equipment for the chemical industry including that used by food processing concerns; settling tanks and components of filters; thickeners and agitators for the mining industry; gasholders and storage tanks (up to 1¼ million gallons capacity); pressure and vacuum vessels used in the petroleum cracking process; and evaporators of particularly large capacity for the recently-established chrome salt industry have for some years been manufactured by Couzin and Attwood, structural and mechanical engineers (Box 6564, Johannesburg). They also produce equipment for the edible oil industry, which has expanded considerably in South Africa in recent years, and condensers of many types. Recently, some special steam-heated mixers for preparation of plastic material used in the manufacture of electric storage battery boxes were produced, as well as kiers for the chemical treament of textiles.

Dermacult (S.A.), makers of cosmetics, have opened a branch factory in Cape Town and a research laboratory at their main premises there. New instruments and machinery, ordered some time ago from overseas, are slowly arriving. "Niva" cream and skin oils are shortly to be manufactured in Durban, where Harts Pharmaceuticals, Ltd., of Welwyn Garden City, England, intend to

construct a factory. After the war the company plans to supply South Africa, and the Middle East and Far East. Mr. C. B. Worsley, who was the South African factory representative in England for several years, is now in the Union, and will become managing director when a local company is formed. In this connection it is being pointed out that so far it has not been possible to export any large quantity of chemicals made in the Union, as these have been needed locally, but a number of firms hope to build up an export trade in the near future.

DDT Production

Steps have been taken by the Union Department of Health to manufacture DDT in South Africa in a factory capable of covering the country's needs. However, for the time being, production is reserved for military purposes, and the factory is actually an addition to a Government munition factory. A Government spokesman said there was nothing to stop commercial firms from producing DDT but he stressed that no arrangements had been made by the Government for the sale of the insecticide to the public.

In the near future, intensive research will probably be made into the utilisation of the large shoals of pilchards off the South African coast to provide vitamin oils and rich protein foods. The work has had largely to be suspended during the war. None the less, the University of Cape Town has been carrying on, and the data it has obtained on the production of fish oils will be of great value to any subsequent manufacturing developments.

General Chemicals Corporation, Johannesburg, have made arrangements with an American chemical organisation to produce under licence in South Africa a number of light and heavy chemicals, some of which were recenly evolved in the United States. It is intended to import from America partially manufactured chemicals which will be further processed and packed in South Africa, in order to save freight charges. In this manner it is hoped to meet overseas competition.

Casein Glue

An interesting and comparatively recent development is the use of skimmed milk for industrial purposes. Five years ago, a firm of chemical manufacturers took up the idea of manufacturing casein glue from milk. Such glues were then comparatively new to South African industries, their use and possibilities having been little explored. The firm had to overcome many difficulties, including the need to develop its own plant, equipment, and manufacturing methods, and to ensure adequate and regular supplies of milk. Previously the skimmed milk left over after the manufacture of butter had been thrown away or used as pig food. The war enabled the new business to expand, as the demand for glues and adhesives became urgent. Still, local consumers had to be convinced that South African casein glues were effective. Gradually this difficulty was overcome, and with the restrictions on the import of glue, manufacture depended more and more on the local product. Casein cold-water glue was followed by the production of slab, granulated, and powdered glue.

PRIVATE TRADE WITH FRANCE

It is understood that the French Government is now prepared to grant, on the conditions mentioned below, licences for import on private account of most manufactured products in quantities less than 5 tons in weight and less than £5000 in value.

Importers will apply in France to the appropriate authorities for import licences, and when these are issued will be able to obtain the foreign exchange necessary for the purchases. Exporters' attention is drawn to the fact that French import licences will only be granted in respect of goods required to meet the essential needs of France. Normal U.K. export licensing procedure will apply to goods subject to licences on export under the Export of Goods (Control) Orders, and applications should be made to the Export Licensing Department, 4 Fenchurch Avenue, London, E.C.3, either directly or through the usual channels for the goods concerned.

Applications for shipping facilities must be made in duplicate, giving the usual information, and, in addition, the French import licence number. They should be addressed to the Commercial Counsellor to the French Embassy, 3 Albert Hall Mansions, London, S.W.7, and must be accompanied by two copies of the relevant invoices. One copy of the application, endorsed if necessary with the shipping priority, will be forwarded by the Commercial Counsellor to the "Service du Transit," French Purchasing Mission, 20 Queen Anne Street, London, W.1, and one copy of the invoice will be returned to the applicant, similarly endorsed. All other correspondence concerning shipment should be conducted direct between the applicant and the "Service du Transit" above mentioned.

Exporters are informed that goods should be consigned to IMPEX (for the importers' account) at port of unloading in France.

The French Government is also prepared to issue licences to export from France on private account. The position with regard to private imports into the United Kingdom from France is in general similar to that with regard to imports on private account from other overseas countries.

Calcium Permanganate

A Powerful Oxidising Agent

by " METALLURGICAL CHEMIST "

CALCIUM permanganate is a reagent which has enjoyed fluctuating fortunes, but its applications appear always to have been more widely developed on the Continent than in this country, where the potassium salt is most popular. As a deodorant, it is claimed to be less nauseous than potassium permanganate (though the difference between them is not markedly pronounced), while it is utilised for disinfectant purposes, and dental uses. In industrial practice, calcium permanganate is employed for the purifying of sugar syrup, for certain textile pursuits, for medicinal preparations, and in a number of miscellaneous fluxing compositions. Its oxidising powers are much greater than those of the potassium or sodium salt, and hence it is engaged in preference to these for numerous research investigations.

Cost of Preparation

In pre-war days, the prices for small lots were quoted as: potassium permanganate, 1s. per lb., sodium permanganate 12s. per lb., and calcium permanganate 8s. per lb., which gives an approximate criterion of their respective values. It has to be noted, however, that the potassium salt has no water of crystallisation, while the sodium salt has three molecules, and the calcium salt four molecules of water. The higher cost of the sodium salt is due mainly to the difficulty of having it appropriately crystallised, but solutions for direct use can be quite economically prepared. With calcalcium permanganate, which is a deliquescent commodity, these difficulties are not so apparent, but the process of manufacture is responsible for the higher costs, apart from the more restricted demand.

About twenty years ago, after the last war period, when much scrap metal abounded on the market, a regular spate of patented processes and specialised fluxes came to light, with a view to rapid removal of the impurities contained in the scrap. These embraced different peroxide salts, including permanganates, one of which was largely made up of the calcium salt. The idea was that the silica of the slag would combine with the lime of the salt and set the oxidising compounds free, but in practice the calcium permanganate was found much too readily fusible, tended to float on the surface of the molten mass, was unnecessarily costly, and was later abandoned. The salt, however, had greater success in medicinal preparations, where it is used to render strychnine sulphate, morphine, and aconitine innocuous by treatment with a 5 per cent. solution.

In the purifying of sugar syrup where the action of sulphurous acid is assisted normally by the addition of potassium or sodium permanganate, the calcium salt has more recently been substituted, by using a modified process.

Modern Production Process

Although calcium permanganate by its formula, $CaMn_2O_8$, contains 46 per cent. oxygen, compared with 40 per cent. from the potassium salt, its oxidising power is so much greater that the addition of a drop of it to alcohol can cause the latter to catch fire. It was largely because of such extremes of oxidising power that the earlier direct process of preparing calcium permanganate by interaction of the silver salt with calcium chloride was abandoned in favour of electrolytic methods. For experimental purposes, however, the first method provides an immediate source of the salt, as the silver chloride by-product obtained by the precipitation can be converted to the permanganate condition for further use. For large-scale output, the system is too circuitous, and does not give a continuous supply of liquor for evaporation purposes. Other calcium compounds, which by direct interaction with potassium permanganate gave calcium permanganate, suffered from the same trouble. There are several electrolytic processes in use in which diaphragm cells are installed, as the salt can be prepared, starting with either the manganate or the permanganate of potassium or sodium, and either the chloride or other salt of calcium.

The process which has seen most service is carried out in a diaphragm cell in which the cathode compartment at first contains calcium chloride, and the anode compartment, potassium permanganate together with some calcium chloride. Although the reaction proceeds according to the formula $2KMnO_4 + CaCl_2 = CaMn_2O_8 + 2KCl$, the resulting solutions are not free from contamination, and although this can be improved upon by separation by means of evaporation and crystallisation, the output is apt to be slowed down. For this reason, using electrolytes in which both anolyte and catholyte are maintained at a specific concentration, the current can be so applied that the calcium permanganate is deposited in the solid condition. All that then remains to be done is to scrape off the deposit, and subject it to a direct refining by

crystallisation to ensure purity, when the salt is ready for use. In works engaged in regular production of alkali permanganates, the electrolytic process was substituted for the earlier application of carbon dioxide gas, as the latter resulted in the conversion to carbonate of some two-thirds of the alkali. This form of electrolysis was performed on the manganate, but it would not pay to attempt an initial preparation of calcium manganate and convert this to permanganate on the large scale in a like manner. This partly accounts for the employment of potassium permanganate in the initial electrolyte, although advantage can be taken, where the latter salt is also produced, to use potassium manganate to electrolyse directly to calcium permanganate, thus eliminating one of the intermediate stages.

An earlier suggested process of crystallising-out sodium chloride from mixed solutions of sodium permanganate and calcium chloride did not give good results in practice.

Regarding literature on the subject, it will be observed that comparatively little appears either in standard works or in periodicals in this country, although the same cannot be said of German literature, where various references can be obtained from *Z. für anorganische Chemie*, while even the earlier Ullmann's Encyclopædia of Technical Chemistry contains some half-dozen short sections. Apparently there has not been the same demand for calcium permanganate here, but according to recent reports it has been utilised in conjunction with hydrogen peroxide for the operation of gas turbines. Whether or not this is correct, it is already established that hydrogen peroxide concentrated by freezing out water, is decomposed with explosive violence when brought into contact with MnO_2. The extent to which this can be taken advantage of in the production of a form of superheated steam, or other means of power, remains to be seen, as also will all possible means of harnessing, regulating, and controlling, but the principle involved is not a new one, as it was known some twenty years ago.

Calcium permanganate appears in pure condition as a purplish-red crystalline mass, with a specific gravity of 2.4 and is deliquescent, so that extremely strong solutions can be used, which in the cold saturated condition have a specific gravity of 1.8.

ELECTRONIC PROCESS TIMER

The Electronic Timer, Type PT.101A, is a small self-contained timing device for the control of processes and machine tools, including such functions as the control of heating time in plastic or rubber moulding processes, and the automatic heat-treatment of metals and other materials. The attachment is quite robust enough to withstand normal production handling.

Only one valve is used and the controlling circuit can handle up to 5 amps A.C. for 1 kW at 230 volts, but larger contactors can be fitted to order. The control can be effected by setting the dial to the required time and switching on the control circuit. By an arrangement of relay contacts, the circuit can be made to function either as a time delay or a process timer.

Specifications, etc., are obtainable from the G.G.C. Development Company, 109 Belgrave Road, London, S.W.1 (VICtoria 6547).

Personal Notes

MR. A. E. SYLVESTER, governor of the Gas Light & Coke Co., has been re-elected chairman of the British Gas Council.

DR. C. R. KENT has been appointed fuel technologist at the fuel technology bureau established at the Australian Government laboratories in Perth.

MR. J. D. CAMPBELL, a director of Williams (Birmingham), Ltd., and technical manager of the London Aluminium Company, has been appointed Assistant Controller of the aluminium fabrication industry in Germany.

DR. F. T. WALL, associate professor of physical chemistry at the University of Illinois, has been awarded the Langmuir prize of $1000, awarded annually by the American Chemical Society. Dr. Wall was cited for his work on polymers.

MR. H. M. DUNCAN, A.R.I.C., for 33 years with C. A. Parsons & Co., Ltd., Newcastle, has retired at the age of 68. He had been chief chemist of the company's Seaton Carew Ironworks and previously research chemist at Woolwich Arsenal.

MR. R. L. PRAIN has been released from his appointment as Controller of Diamond Tools as from June 30, and the Control has been terminated. He will continue to act as Controller of Diamond Dies and as Controller of Quartz Crystals.

MR. A. R. KNOWLES, secretary of the Sheffield Chamber of Commerce, has been appointed director of the Joint Iron Council, a national body formed recently by producers of foundry pig-iron and the Council of Iron Foundry Associations.

COMMANDER F. J. COULDREY, chairman of the Kenya Pyrethrum Board, and MR. ROGER NORTON, will shortly visit the United States on behalf of the Board. Kenya pyrethrum is in urgent demand by the military authorities, particularly for use in the war against Japan.

MR. J. F. THORN, general manager of Lake View and Star, Ltd., Kalgoorlie, Western Australia, has been awarded the medal of the Australasian Institute of Mining and Metallurgy for 1945. Mr. Thorn's efforts have been an important factor in re-establishing mining in Western Australia.

MR. J. DAVIDSON PRATT, O.B.E., M.A., B.Sc., F.R.I.C., M.I.Chem.E., previously general manager and secretary of the Association of British Chemical Manufacturers, whose return from Government service was recently announced, has been appointed director and secretary of the Association. MR R. MURDIN DRAKE, O.B.E., M.Sc., and MR. ALIAN J. HOLDEN, B.Sc., F.R.I.C., who, during the last five years have been assistant managers, have been appointed joint managers of the Association.

At the annual general meeting of B. Laporte, Ltd., two additional directors were appointed: MR. ROBERT BARCLAY CRAIG, and MR. JAMES HARNAMAN. Both have been associated with the company for over 20 years. Mr. Craig, the sales technical development manager, is at present on a mission to Canada and U.S.A. in connection with the company's activities. Mr. Harnaman is works manager, and was awarded the M.B.E. in the recent Honours List.

DR. B. J. A. BARD, B.Sc., D.I.C., barrister-at-Law, who has been appointed secretary of the F.B.I. Industrial Research Committee and head of the F.B.I. Research Secretariat, began his professional life conducting fuel research, under the late Professor W. A. Bone, F.R.S., in the chemical technical department, Imperial College. He then read for the Bar at Grays Inn and practised at the Bar until the outbreak of war, after which he worked with the Coal Commission and, later, on industrial production and research problems at the Ministries of Supply and Aircraft Production.

DR. THOMAS S. WHEELER, D.Sc., Ph.D., F.R.I.C., F.Inst.P., an outstanding member of the Eire Emergency Scientific Research Bureau since 1939, has been nominated Professor of Chemistry at University College, Dublin. He began his teaching career as demonstrator at the Royal Technical College, Glasgow, in 1920-21, but then went over to industrial research, first at the Royal Naval Cordite Factory, Holton Heath, and the Royal Arsenal, Woolwich (1921-28), and then with I.C.I. at Northwich (1928-31). From 1931 until 1939 he was Professor of Organic Chemistry at the Royal Institute of Science, Bombay, and was Dean of the Faculty of Science at the University there. He is, in addition, a Foundation Fellow of the National Institute of Sciences of India. Dr. Wheeler has also just been appointed an additional member of the Building Research Committee which has been established by the Minister for Industry and Commerce for the investigation and development of building materials.

Obituary

DR. JOSEPH CHARLES KERNOT, F.R.I.C., who died at Tunbridge Wells on July 6, within a few days of his 67th birthday, was an authority on the chemistry of adhesives. He was a native of Naples and was educated at the University there, where later he took his doctorate and became assistant Professor of Chemistry. For some years after 1928, he served on the Adhesives Committee of the D.S.I.R. and made valuable contributions to the study of glues and gelatine. His Fellowship of the Royal Institute of Chemistry dated from 1922.

General News——From Week to Week

The Scientific Film Association is holding a conference on "The Film in Science" at Huddersfield from August 31 to September 2.

Reviews of commercial conditions in Mexico and in Peru are the two latest additions to the series published by the B.O.T. (1s. and 6d. respectively).

The D.S.I.R. has issued Vol. XVII, No. 5, of its Monthly Summary of Current Literature on Water Pollution Research (H.M.S.O., 2s.).

The Control of Mica (No. 4) Order, 1945 (S. R. & O. 1945, No. 813) which came into force on July 10, amends the Control of Mica (No. 3) Order, 1944, so that built-up mica and mica splittings other than book-form splittings are exempt from control under Ministry of Supply Orders.

To meet the large potential demand for titanium oxide pigments, particularly for the newly-developed rutile types, the British Titan Products Co., Ltd., Billingham, Co. Durham, has acquired a site, extending over 53 acres near Grimsby, on which to erect its second titanium pigment plant in this country.

An explosion, the cause of which is unknown, was the origin of a serious fire at the Hardwick (Notts.) by-product benzol plant last week. But for the fine work of the works' fire brigade and of the Chesterfield and Staveley units of the N.F.S. the outbreak would have assumed more serious consequences. Damage was extensive, the toluene section of the plant being put out of operation.

The Chemical Engineering Group, Society of Chemical Industry, has just issued Vol. XXIV of its *Proceedings,* price 21s., covering the year 1942. Besides a general discussion on the Development of New Chemical Processes, several notable papers are included, among them Hutchison and Spivey on "Design and Performance of Cooling Towers," Ruhemann on "The Separation of Gases," and Manning on "The Production of Concentrated Nitric Acid."

Industrialists are to be given a chance to buy surplus light metal fabricating plant, provided at Government expense during the war for rolling, forging, and casting light metals, and now for disposal subject to any existing option. In some cases, complete units of plants and buildings can be obtained, and those applying should state their needs in type and capacity of plant and, in the case of complete units, the area desired, to the Ministry of Aircraft Production, Banbury.

The wholesale price index for all articles for last month shows an increase from 168.1 to 170.0, as compared with 166.1 last year. The index for chemicals and oils at 150.9 registered an increase by 0.2 points on the month, comparing with 151.7 a year ago. While the index for iron and steel remained stable at 189.4 (183.4), the largest rise in any group took place in the non-ferrous metals group, the index standing now at 127.2, against 123.9 in May and 128.0 in June, 1944. This increase was due to the average increases of 13 per cent., 8 per cent., and 1½ per cent. in the prices of zinc, lead and brass, respectively.

Foreign News

In Italy, production of urgently needed plastic articles is at a standstill, owing to the lack of formaldehyde, phenols and resins.

A Spanish trade delegation will shortly go to South Africa to negotiate for an exchange of mercury, cork and phosphates against South African wool, coal and copper.

In the three months ended April 1, 1945, British Guiana exported 88,750 gallons of molasses, compared with *nil* during the same period last year.

Three new nitrogen plants are being erected in the Soviet Union, according to an article in *Trud,* while others are being reconstructed.

Production of pure nickel will begin shortly at Monchegovsk, at the tip of Lake Imandra, on the Kola Peninsula, where rich deposits occur.

The Solikamsk potash mines in the U.S.S.R. have been reopened and the concentrator has resumed operations. The potash mines of Chkalov and Sredni are also reported to be working again.

France received from the date of liberation up to the end of April last 13,000 tons of electrolytic and 14,000 tons of blister copper, besides collecting 12,000 tons of scrap metal.

A new Soviet-Polish trade agreement provides for a reciprocal exchange of goods to the value of over £30 millions for the latter half of this year. Moscow requires coal, metals, chemicals and textile goods in exchange for raw materials.

Drilling for oil is expected to begin shortly in the Gaza area of Southern Palestine, where there are believed to be substantial oil resources. Drilling equipment has already been ordered from England. Operations will be in the hands of the Petroleum Development (Palestine), Ltd., a subsidiary of the Iraq Petroleum Co.

Imports into Canada of materials for use only in the manufacture of moulding compositions of cellulose acetate or other derivatives of cellulose, in powder or granular form, are to be accorded duty-free entry.

Brazil's imports in 1944 included: lead, 11,504 tons; copper, 6681 tons; zinc, 2598 tons; sulphur, 38,790 tons; caustic soda, 34,726 tons; soda ash, 20,208 tons; bicarbonate of soda, 3032 tons; and resins, 11,876 tons.

The Companhia Aços Especiais Itabira has been established in the Rio Doce area of Minas Geraes, Brazil, for the production of alloys and special steels. It is reported that equipment, to include 25-ton electric steel furnaces, is to be purchased in the U.S.A.

Tests carried out by Geller and Yavorsky (*J. Research*, April, 1945, RP 1649) with alumina of over 99.9 per cent. purity, have provisionally established the melting-point of alumina at between 2000° and 2030° C.; the value usually quoted hitherto has been 2050°.

On the Russian Black Sea coast, experiments have been made with the cinchona tree, and the Pitsunda research station for medicinal plants is studying possibilities for a large-scale cultivation on collective farms in the region.

The Instrument Society of America has been organised in Pittsburgh to advance the arts and sciences connected with the theory, design, manufacture, and use of instruments. The temporary office is at 1117 Wolfendale Street, Pittsburgh 12, Pa.

The average hourly earnings in the United States chemical and allied industries amounted to 97.3 cents in February, as compared with 67.2 cents in Canada. The average hours worked per week amounted to 45.6 in both countries.

Exports of vanilla from Dominica, British West Indies, have greatly increased during the war. In 1939 the colony exported 9428 lb. (value £4681) and, in 1944, 50,833 lb. (value £68,399). The vanilla is chiefly used for flavouring essences and in the manufacture of oleo resin.

The heavily bomb-damaged Giannelli **aluminium-ware plant** in Rome is employing about 30 per cent. of its pre-war personnel and using approximately 30 tons of aluminium monthly in producing kitchen utensils, including bright-coloured ware, by its special aluminium-colouring process.

An expansion of the nylon plant at Kingston, Ontario, owned by Canadian Industries, Ltd., at a cost of approximately $4,000,000 is already under way. It is expected that all construction work will be completed by the middle of 1946, when the annual capacity of the plant will be 2,250,000 lb. of nylon yarn per year, compared with the present capacity of 1,500,000 lb.

The United States' known reserves of potash have been increased through the discovery of thick beds of potash-containing minerals in eastern Utah, reports the U.S. Geological Survey. The thickest bed is said to be more than 90 ft., at depths between 3300 and 4200 ft.

News from the Soviet Union state that the coke-oven industry is likely to undergo a substantial expansion in the course of the next few years. A new coke-oven battery has been put into commission at Magnitogorsk; another one will also be installed at the Azovstal plant and begin production next month, while similar plans are reported from Novo-Enakievi and Dnepropetrovsk.

Long-term contracts for North African phosphates provide for the shipment of 550,000 tons to Italy, while the French-Swedish trade agreement envisages the shipment of 100,000 tons to Sweden. It is also being reported that Engrais de Roubaix, a French fertiliser company, has issued a debenture loan of 30,000,000 fr.

French aluminium productive capacity will soon be sufficient to meet the bulk of the country's demands, according to the annual report of the Péchiney company. Serious damage was done to French aluminium plants last year; some had to stop working, in others output seriously declined, but reconstruction work is going on in the damaged factories.

Melamine is being produced by Stockholm's Superfosfat Fabriks A/B at its Ljungaverk plant. The raw material (carbide), in combination with formaldehyde, produces a resinous substance, which can be used for the manufacture of glues and plastics. Synthetic glues have now almost entirely replaced the imported product in Sweden.

A new chemical and mineralogical laboratory has been erected in Perth, W. Australia, for the Department of Mines at a cost of £42,000. The work of the laboratory will be directed to the establishment of secondary industries. Agricultural development will also be assisted by the study of soils; plant deficiencies will be investigated, as well as matters connected with forestry, water supply, drugs and toxicology.

Canada's imports (in thousand dollars) for the first four months of the current year (gold excluded) totalled 508,371 (553,012). Chemicals accounted for 25,787 (26,342), iron and its products for 129,289 (143,631) and non-ferrous metals for 34,127 (36,114). Exports (in thousand dollars), during the same period, amounted to 1,080,360 (1,034,753). The share of chemical products in the total rose from 31,340 last year to 44,298; non-metallic minerals are practically unchanged at 17,500 while iron and its products show a slight increase to 246,081 (242,220).

The House of Representatives' Small Business Committee has alleged that the United States Diamond Match Co., in cartel agreement with the Swedish Match Co., " pretty well controls the world match market. They apparently control the British Match Corporation, the Japanese match industry, and Russian match production. It is perhaps one of the most highly monopolised industries in the U.S. In fact, it far exceeds a monopoly and is definitely one of the world's largest cartel arrangements." The Diamond Match Co. has since totally denied the allegation.

The Soviet aluminium industry is to be expanded further. Plants at Leningrad and Zaporozhe are now being repaired, those at Stalino and Bogoslovsk are to be extended, while the Kandalaksha plant is to be completed. Aluminium works are also to be erected in Transcaucasia. Modern machinery has been installed in the bauxite mines in the Northern Urals and near Sokolov which had been enlarged to meet the war-time needs of the Ural aluminium plants. As regards manganese production, an increase of over 150 per cent. during the war is being reported. The Solikamsk mines in particular have increased their output.

The Ukraine will soon again become a large supplier of aromatic oils. Large areas on the lower stretches of the Ukrainian rivers are being planted with lavender and roses, and mint, cumin and coriander will be cultivated in several districts. Distilleries are being repaired, so that the pre-war production of 300 tons of essential oils is likely to be reached within the next two or three years, while synthetic essences for the manufacture of perfumery will be made in a new Soviet plant now under construction at Kaluga, and other factories are to be set up at Molotov, Tiflis and Kiev. In the Crimea, special efforts are being made to rehabilitate the rose oil industry.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

U.D.A. (PLASTICS), LTD., Bristol. (M., 21/7/45.) June 28, £1300 mortgage, to C. H. Gooding, Bath; charged on Drill Hall and Victoria Cottage, Upper Bristol Road, Bath. *Nil. November 9, 1943.

Satisfaction

CELLACTITE & BRITISH URALITE, LTD., Rochester. (M.S., 21/7/45.) Satisfaction June 30, of debenture registered July 31, 1940.

Company News

Lansil, Ltd., reports a profit, for the year to April 1, of £49,199 (£56,612). The ordinary dividend is 8.3924 per cent. (same).

Titanine, Ltd., reports a profit, for the year to March 31, of £26,558 (£26,847). The dividend is maintained at 20 per cent.

British Plaster Board, Ltd., has made a profit, for the year to March 31, of £273,437 (£163,028). A final ordinary dividend of 9d. (unchanged) makes a total of 1s. 3d. (same).

The Yorkshire Dyeware and Chemical Co., Ltd., reports a profit, for the year to March 31, of £40,344 (£42,477). A final ordinary dividend of 5 per cent. (same) brings the total distribution up to 15 per cent. (same).

Boots Pure Drug Co., Ltd. reports a trading profit, for the year to March 31, of £1,268,061 (£1,270,586). The net profit totals £554,139 (£533,834). The total ordinary dividend is increased by 2½ per cent. to 32½ per cent.

The Distillers Co., Ltd. reports a trading profit, for the year to May 15, of £2,173,718 (£2,100,600). The net profit totals £2,157,663 (£2,084,545). A final of 11½ per cent. (10 per cent.), and a bonus of 2½ per cent. (same) makes, with the interim of 6¼ per cent. (same), a total distribution of 20 per cent. (18¾ per cent.)

Beechams Pills, Ltd. report a net profit of £377,962 (£373,448). The deferred dividend is maintained at 32 per cent. Trading profit of the group is £2,501,642 (£2,409,256). Of the subsidiaries, **Yeast-Vite, Ltd.,** reports a net profit of £171,986 (£160,051); **Eno Proprietaries, Ltd.,** £160,027 (£146,800); **Veno Drug Co., Ltd.,** £217,105 (£215,745); **Beecham Maclean Holdings, Ltd.,** £265,772 (£248,954) and **Macleans, Ltd.,** £177,827 (£198,628). The parent company proposes to change its name from Beechams Pills, Ltd., to Beecham Group, as pills represent only 3 per cent. of the group's turnover.

New Companies Registered

Peat Industrial Research (Scotland), Ltd. (23,373).—Private company, registered in Edinburgh. Capital £3000 in £1 shares. To conduct and finance industrial or scientific research or investigation in reference to any product or material in which peat or any substance of a nature allied or kindred thereto is concerned. Subscribers: A. S. Goss and Edith K. MacFarlane, both of 19 Blythswood Square, Glasgow, C.2.

Prices of British Chemical Products

QUIETER conditions continue to operate in the London market for general chemicals, due chiefly to the holiday period in the Midlands. Nevertheless, a fair amount of fresh inquiry for both home and export account has been reported, although actual new buying has been of limited dimensions. The price position throughout the market remains firm. In the soda products section yellow prussiate of soda and chlorate of soda are being called for in fair quantities, while a moderate trade is passing in caustic soda and hyposulphite of soda. Glauber salt and salt cake are steady. Among the potash products, permanganate of potash is firm and in good request, while supplies of caustic potash and bichromate of potash are none too plentiful and offers are quickly absorbed. Acid phosphate of potash is a brisk market. In other directions acetone is in good request and a steady trade is passing in glycerine, sulphur and white powdered arsenic. There is a good call for peroxide of hydrogen and a moderate inquiry is reported for alum lump. A fair trade is passing in the coal-tar products section and further export orders have been received for pitch. Cresylic acid is in good demand and fresh inquiry is reported for carbolic acid. The naphthas, xylols, toluols, and benzols remain active.

MANCHESTER.—Bleaching, dyeing, finishing and other classes of industrial chemicals are being adversely affected by the industrial holidays, both as regards contract deliveries and new business, but, on the whole, trade conditions on the Manchester chemical market during the past week have been fairly satisfactory and new orders have covered a moderate quantity in the aggregate. The bulk of the trade has been on home consumption account, with the balance for shipment. A fair number of export inquiries have been in the market and it is expected that the volume of actual business will grow as the problem of arranging freights becomes less difficult.

GLASGOW.—In the Scottish heavy chemical trade activity has been quiet during the past week for home business owing to the local holidays which have now started in the Glasgow district. Export inquiries are being received regularly.

Price Changes

Rises: Benzol; formaldehyde; lead acetate; naphtha; pitch; toluol; xylol; zinc oxide.
Falls: Arsenic.

General Chemicals

Acetic Acid.—Maximum prices per ton: 80% technical, 1 ton £39 10s.; 10 cwt./1 ton, £40 10s., 4/10 cwt., £41 10s.; 80% pure, 1 ton, £41 10s.; 10 cwt./1 ton, £42 10s.; 4/10 cwt., £43 10s.; commercial glacial, 1 ton, £49; 10 cwt./1 ton, £50; 4/10 cwt., £51; delivered buyers' premises in returnable barrels, £4 10s. per ton extra if packed and delivered in glass.

Acetone.—Maximum prices per ton, 50 tons and over, £65; 10/50 tons, £65 10s.; 5/10 tons, £66; 1/5 tons, £66 10s.; single drums, £67 10s.; delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each. For delivery in non-returnable containers of 40/50 gallons, the maximum prices are £3 per ton higher. Deliveries of less than 10 gallons free from price control.

Alum.—Loose lump, £16 per ton, f.o.r.

Aluminium Sulphate.—Ex works, £11 5s. per ton d/d.

Ammonia, Anhydrous.—1s. 9d. to 2s. 3d. per lb.

Ammonium Carbonate.—£37 10s. to £38 per ton d/d in 5 cwt. casks.

Ammonium Chloride.—Grey galvanising, £22 10s. per ton, in casks, ex wharf. Fine white 98%, £19 10s. per ton. See also Salammoniac.

Antimony Oxide.—£111 to £117 per ton.

Arsenic.—Per ton, according to quantity: 99/100%, £49 to £52; white, 98/99%, £47 to £50; grey, 96/97%, £42 to £45; grey, 95/96%, £40 to £43.

Barium Carbonate.—Precip., 4-ton lots, £19 per ton d/d; 2-ton lots, £19 5s. per ton, bag packing, ex works.

Barium Chloride.—98/100% prime white crystals, 4-ton lots, £19 10s. per ton, bag packing, ex works.

Barium Sulphate (Dry Blanc Fixe).—Precip., 4-ton lots, £18 15s. per ton d/d; 2-ton lots, £19 10s. per ton.

Bleaching Powder.—Spot, 35/37%, £11 to £11 10s. per ton in casks, special terms for contract.

Borax.—Per ton for ton lots, in free 1-cwt. bags, carriage paid: Commercial, granulated, £30; crystals, £31; powdered, £31 10s.; extra fine powder, £32 10s. B.P., crystals, £39; powdered, £39 10s.; extra fine, £40 10s. Borax glass, per ton in free 1-cwt. waterproof paper-lined bags, for home trade only, carriage paid: lump, £77; powdered, £78.

Boric Acid.—Per ton for ton lots in free 1-cwt. bags, carriage paid: Commercial, granulated, £52; crystals, £53; powdered, £54; extra fine powder, £56. B.P., crystals, £61; powder, £62; extra fine, £64.

Calcium Bisulphide.—£6 10s. to £7 10s. per ton f.o.r. London.

Calcium Chloride.—70/72% solid, £5 15s. per ton, ex store.

Charcoal, Lump.—£15 to £16 per ton, ex wharf. Granulated, supplies scarce.

Chlorine, Liquid.—£23 per ton, d/d in 16/17 cwt. drums (3-drum lots).

Chrometan.—Crystals, 5½d. per lb.

Chromic Acid.—1s. 5d. per lb., less 2½%, d/d U.K.

Citric Acid.—Controlled prices per lb., d/d buyers' premises. For 5 cwt. or over, anhydrous, 1s. 6¾d., other, 1s. 5d.; 1 to 5 cwt., anhydrous, 1s. 9d., other, 1s. 7d. Higher prices for smaller quantities.

Copper Oxide.—Black, powdered, about £100 per ton.

Copper Sulphate.—£32 5s. per ton, f.o.b., less 2%, in 2 cwt. bags.

Cream of Tartar.—100 per cent., per cwt., for 10 cwt., or more, £14 11s. 6d.; 5 to 10 cwt., £14 12s. 6d.; 2 to 5 cwt., £14 13s. 6d.; 1 to 2 cwt., £14 14s. 6d., d/d in sellers' returnable casks. Less than 1 cwt., 2s. 8d. to 2s. 10d. per lb. d/d. Maximum controlled prices.

Formaldehyde.—£27 to £28 10s. per ton in casks, according to quantity, d/d.

Formic Acid.—85%, £47 per ton for ton lots, carriage paid; smaller parcels quoted up to 50s. per cwt., ex store.

Glycerine.—Chemically pure, double distilled 1260 s.g., in tins, £4 to £5 per cwt., according to quantity; in drums, £3 19s. 6d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

Hexamine.—Technical grade for commercial purposes, about 1s. 4d. per lb.; free-running crystals are quoted at 2s. 1d. to 2s. 3d. per lb.; carriage paid for bulk lots.

Hydrochloric Acid.—Spot, 7s. 6d. to 8s. 9d. per carboy d/d, according to purity, strength and locality.

Hydrofluoric Acid.—59/60%, about 1s. to 1s. 2d. per lb.

Iodine.—Resublimed B.P., 10s. 4d. to 14s. 6d. per lb., according to quantity.

Lactic Acid.—Pale tech., £60 per ton; dark tech., £52 per ton ex works; barrels returnable.

Lead Acetate.—White, 52s. to 55s. per cwt. according to quantity. MANCHESTER: £51 to £54 per ton.

Lead Nitrate.—About £47 per ton d/d in casks.

Lead, Red.—Basic prices, per ton: Genuine dry red lead, £45 10s.; rutile, £45 10s.; orange lead, £57 10s. Ground in oil: Red, £59; orange, £71. Ready-mixed lead paint: Red, £63 10s.; orange, £75 10s.

Lead, White.—Dry English, in 8-cwt. casks, £55 per ton. Ground in oil, English, in 5-cwt. casks, £67 per ton.

Litharge.—1 to 2 tons, £44 10s. per ton.

Lithium Carbonate.—7s. 9d. per lb. net.

Magnesite.—Calcined, in bags, ex works, £18 15s. to £22 15s. per ton.

Magnesium Chloride—Solid (ex wharf), £22 per ton.

Magnesium Sulphate.—£12 to £14 per ton.

Mercury Products.—Controlled price for 1-cwt. quantities: Bichloride powder, 15s. 8d.; bichloride lump, 16s. 3d.; mercury oxide, red cryst., 20s. 9d.; red levig., 20s. 3d.; red tech., 19s. 11d.; yellow levig., 20s. 2d.; yellow tech., 19s. 7d.; sulphide, red, 17s. 9d.

Methylated Spirit.—Industrial 66° O.P. 100 gals., 2s. 4d. per gal.; pyridinised 64° O.P. 100 gals., 2s. 5d. per gal.

Nitric Acid.—£24 to £26 per ton, ex works.

Oxalic Acid.—£60 to £65 per ton for ton lots, carriage paid, in 5-cwt. casks; smaller parcels would be dearer; deliveries slow.

Paraffin Wax.—Nominal.

Potash, Caustic.—Solid, £65 10s. per ton for 1-ton lots; flake, £73 per ton for 1-ton lots. Liquid, d/d, nominal.

Potassium Bichromate.—Crystals and granular, 7¾d. per lb.; ground, 8¾d. per lb., for not less than 6 cwt.; 1-cwt. lots, ¼d. per lb. extra.

Potassium Carbonate.—Calcined, 98/100%, £67 5s. per ton ex store; hydrated, £61 10s. per ton.

Potassium Chlorate.—Imported powder and crystals, nominal.

Potassium Iodide.—B.P., 8s. 8d. to 12s. per lb., according to quantity.

Potassium Nitrate.—Small granular crystals, 76s. per cwt. ex store, according to quantity.

Potassium Permanganate.—B.P., 1s. 8½d. per lb. for 1-cwt. lots; for 3 cwt. and upwards, 1s. 8d. per lb.; technical, £7 12s. to £8 6s. 3d. per cwt., according to quantity d/d.

Potassium Prussiate.—Yellow, nominal.

Salammoniac.—First lump, spot, £48 per ton; dog-tooth crystals, £50 per ton; medium, £48 10s. per ton; fine white crystals, £19 10s. per ton, in casks, ex store.

Soda, Caustic. — Solid 76/77%; spot, £16 7s. 6d. per ton d/d station.

Sodium Acetate.—£42 per ton, ex wharf.

Sodium Bicarbonate.—Refined, spot, £11 per ton, in bags.

Sodium Bichromate.—Crystals, cake and powder, 6½d. per lb.; anhydrous, 6½d. per lb., net, d/d U.K.

Sodium Bisulphite. — Powder, 60/62%, £19 10s. per ton d/d in 2-ton lots for home trade.

Sodium Carbonate Monohydrate.—£21 per ton d/d in minimum ton lots in 2 cwt. free bags.

Sodium Chlorate.—£36 to £45 per ton, nominal.

Sodium Hyposulphite.—Pea crystals, £21 10s. per ton for 2-ton lots; commercial, £15 per ton.

Sodium Iodide.—B.P., for not less than 28 lb., 9s. 11d. per lb., for not less than 7 lb., 13s. 1d. per lb.

Sodium Metasilicate.—£16 10s. per ton, d/d U.K. in ton lots.

Sodium Nitrite.—£20 to £23 10s. per ton.

Sodium Percarbonate.—21½% available oxygen, £7 per cwt.

Sodium Phosphate.—Di-sodium, £26 10s. per ton d/d for ton lots. Tri-sodium, £27 10s. per ton d/d for ton lots.

Sodium Prussiate.—9d. to 9½d. per lb. ex store.

Sodium Silicate.—£6 to £11 per ton.

Sodium Sulphate (Glauber Salt).—£4 10s. per ton d/d.

Sodium Sulphate (Salt Cake).—Unground. Spot £4 11s. per ton d/d station in bulk. MANCHESTER: £4 12s. 6d. to £4 15s. per ton d/d station.

Sodium Sulphide. — Solid, 60/62%, spot, £18 5s. per ton, d/d, in drums; crystals, 30/32%, £12 7s. 6d. per ton, d/d, in casks.

Sodium Sulphite.—Anhydrous, £29 10s. per ton; pea crystals, £20 10s. per ton d/d station in kegs; commercial, £12 to £14 per ton d/d station in bags.

Sulphur.—Per ton, ground, £15-£16.

Sulphuric Acid.—168° Tw., £6 10s. to £7 10s. per ton; 140° Tw., arsenic-free, £4 11s. per ton; 140° Tw., arsenious, £4 3s. 6d. per ton. Quotations naked at sellers' works.

Tartaric Acid.—Per cwt., for 10 cwt. or more, £19 12s.; 5 to 10 cwt., £19 13s. 6d.; 2 to 5 cwt., £19 15s.; 1 to 2 cwt., £19 17s. Less than 1 cwt., 3s. 7d. to 3s. 9d. per lb. d/d, according to quantity. Maximum controlled prices.

Tin Oxide.—Nominal.

Zinc Oxide.—Maximum prices per ton for 2-ton lots, d/d: white seal, £38 15s.; green seal, £37 15s.; red seal, £36 5s.

Zinc Sulphate.—Tech., £20-£21 per ton, carriage paid, casks free.

Rubber Chemicals

Antimony Sulphide.—Golden, 1s. 2d. to 2s. 1½d. per lb. Crimson, 2s. 2d. to 2s. 6d. per lb.

Arsenic Sulphide.—Yellow, 1s. 9d. per lb.

Barytes.—Best white bleached, £8 3s. 6d. per ton.

Cadmium Sulphide.—6s. to 6s. 6d. per lb.

Carbon Bisulphide.—£34 to £39 per ton, according to quality, in free returnable drums.

Carbon Black.—6d. to 8d. per lb., according to packing.

Carbon Tetrachloride.—£44 to £49 per ton, according to quantity.

Chromium Oxide.—Green, 2s ped lb.

India-rubber Substitutes.—White, 6 3/16d. to 10½d. per lb.; dark, 6 3/16d. to 6 15/16d. per lb.

Lithopone.—30%, £25 per ton; 60%, £31 to £32 per ton. Imported material would be dearer.

Mineral Black.—£7 10s. to £10 per ton.

Mineral Rubber, "Rupron."—£20 per ton.

Sulphur Chloride.—7d. per lb.

Vegetable Lamp Black.—£49 per ton.

Vermilion.—Pale or deep, 15s. 6d. per lb. for 7-lb. lots.

Plus 5% War Charge.

Nitrogen Fertilisers

Ammonium Phosphate.—Imported material, 11% nitrogen, 48% phosphoric acid, per ton d/d farmer's nearest station, £21 15s.

Ammonium Sulphate.—Per ton in 6-ton lots, d/d farmer's nearest station, in July, £9 10s. rising by 1s. 6d. per ton per month to March, 1946.

Calcium Cyanamide.—Nominal; supplies very scanty.

Concentrated Fertilisers.—Per ton d/d farmer's nearest station, I.C.I. type "Special No. 1," new season's prices not yet fixed.

"Nitro Chalk."—£9 14s. per ton in 6-ton lots, d/d farmer's nearest station.

Sodium Nitrate.—Chilean super-refined for 6-ton lots d/d nearest station, £15 15s. per ton; granulated, over 98%, £10 14s. per ton.

Coal Tar Products

Benzol.—Per gal. ex works: 90's, 2s. 6d.; pure, 2s. 8½d.; nitration grade, 2s. 10½d.

Carbolic Acid.—Crystals, 11½d. per lb. Crude, 60's, 4s. 3d. MANCHESTER: Crystals, 9½d. to 11½d. per lb., d/d; crude, 4s. 3d., naked, at works.

Creosote.—Home trade, 6½d. to 7d. per gal., f.o.r. maker's works. MANCHESTER, 6½d. to 9½d. per gal.

Cresylic Acid.—Pale, 97%, 3s. 6d. per gal.; 99%, 4s. 2d.; 99.5/100%, 4s. 4d. American, duty free, 4s. 2d., naked at works. MANCHESTER: Pale, 99/100%, 4s. 4d. per gal.

Naphtha.—Solvent, 90/160°, 2s. 10d. per gal. for 1000-gal. lots; heavy, 90/190°, 2s. 4d. per gal. for 1000-gal. lots, d/d. Drums extra; higher prices for smaller lots. Controlled prices.

Naphthalene.—Crude, ton lots, in sellers' bags, £7 4s. to £10 13s. per ton, according to m.p.; hot-pressed, £11 10s. to £12 14s. per ton, in bulk ex works; purified crystals, £25 15s. to £28 15s. per ton. Controlled prices.

Pitch.—Medium, soft, 60s. to 65s. per ton, f.o.b. MANCHESTER: 60s. to 62s. 6d. per ton f.o.b.

Pyridine.—90/140°, 17s. to 17s. 6d. per gal.; 90/160°, 13s. MANCHESTER, 14s. to 18s. per gal.

Toluol.—Pure, 3s. 0½d. per gal.; 90's, 2s. 4½d. per gal. MANCHESTER: Pure, 3s. 1d. per gal. naked.

Xylol.—For 1000-gal. lots, 3s. 3½d. to 3s. 6d. per gal., according to grade, d/d.

Wood Distillation Products

Calcium Acetate.—Brown, £21 per ton; grey, £24. MANCHESTER: Grey, £24 to £25 per ton.

Methyl Acetone.—40/50%, £56 per ton.

Wood Creosote.—Unrefined, about 2s. per gal., according to boiling range.

Wood Naphtha, Miscible.—4s. 6d. to 5s. 6d. per gal.; solvent, 5s. 6d. per gal.

Wood Tar.—£5 per ton.

Intermediates and Dyes (Prices Nominal)

m-**Cresol** 98/100%.—Nominal.

o-**Cresol** 30/31° C.—Nominal.

p-**Cresol** 34/35° C.—Nominal.

Dichloraniline.—2s. 8½d. per lb.

Dinitrobenzene.—8½d. per lb.

Dinitrotoluene.—48/50° C., 9½d. per lb; 66/68° C., 1s.

p-**Nitraniline.**—2s. 5d. per lb.

Nitrobenzene.—Spot, 5½d. per lb. in 90-gal. drums, drums extra, 1-ton lots d/d buyer's works.

Nitronaphthalene.—1s. 2d. per lb.; P.G., 1s. 0½d. per lb.

o-**Toluidine.**—1s. per lb., in 8/10 cwt. drums, drums extra.

p-**Toluidine.**—2s. 2d. per lb., in casks.

m-**Xylidine Acetate.**—4s. 5d. per lb., 100%.

Latest Oil Prices

LONDON.—July 18.—For the period ending August 4 (July 21 for refined oils), per ton, naked, ex mill, works or refinery, and subject to additional charges according to package: LINSEED OIL, crude, £62. RAPESEED OIL, crude, £88. COTTONSEED OIL, crude, £52 2s. 6d.; washed, £55 5s.; refined edible, £57; refined deodorised, £58. COCONUT OIL, crude, £49; refined deodorised, £49; refined hardened deodorised, £53. PALM KERNEL OIL, crude, £48 10s.; refined deodorised, £49; refined hardened deodorised, £53. PALM OIL, refined deodorised, £53; refined hardened deodorised, £58. GROUNDNUT OIL, crude, £56 10s.; refined deodorised, £58; refined hardened deodorised, £62. WHALE OIL, crude hardened, 42 deg., £51 10s.; refined hardened, 46/48 deg., £52 10s. ACID OILS: Groundnut, £40; soya, £38; coconut and palm-kernel, £43 10s. ROSIN, 30s. 6d. to 45s. per cwt., ex store, according to grade. TURPENTINE, American, 87s. per cwt. in drums or barrels, as imported (controlled price).

Chemical and Allied Stocks and Shares

BUSINESS in stock markets remained on a small scale during the week, but the general undertone was again steady, industrials moving within narrow limits, while home rails tended to rally and British Funds remained firm. Sentiment continued to reflect a waiting attitude, pending the result of the General Election. Shares of chemical and kindred companies were generally well maintained, Imperial Chemical again changing hands around 40s., while Turner & Newall were 82s. 6d., B. Laporte 87s. 6d., and United Molasses 43s. British Drug Houses at 39s. 6d. lost part of their recent rise. Despite the strong position, emphasised by the consolidated accounts, the units of the Distillers Co. receded to 117s. Goodlass Wall 10s. ordinary, however, remained in favour on further consideration of the results and higher dividend, and showed a fresh rise to 25s. Ruston & Hornsby also moved higher to 54s., but elsewhere, British Oxygen reacted to 87s., Dunlop Rubber to 51s., and Triplex Glass at 43s. lost part of an earlier rise.

United Steel at 26s. 9d. were steady on the company's capital plans, and Powell Duffryn at 22s. 9d. were little changed on the full results. The past year's figures tended to draw more attention to British Plaster Board which changed hands around 37s. 3d. Despite the larger capital, earnings on the 5s. units last year were nearly 30 per cent., compared with the unchanged 25 per cent. dividend. British Glues & Chemicals 4s. ordinary held their recent rise to 11s. 6d., the past year's results also attracting buyers in this case, as the maintained 10 per cent. dividend is very conservative. Enfield Rolling Mills, however, eased to 21s. 7½d. on the decline in net profits from £25,174 to £12,399, but the latter are struck after generous provisions for depreciation, etc., and the chairman points out that maintenance of the dividend at 5 per cent. is fully justified.

In other directions, Thomas & Baldwins 6s. 8d. units attracted rather more attention around 12s. 10½d., the yield of nearly 6½ per cent. bringing in buyers. Baldwins Holdings at 6s. 1½d. were firmer, and Guest Keen were 41s. on the full results. Dorman Long eased to 28s. 1½d., and the preferred ordinary shares to 52s. 6d. Babcock & Wilcox rose to 59s. 3d., Staveley were 48s. 6d., Tube Investments £5 9/16, Stewarts & Lloyds 55s. 9d., and Hadfields 10s. units strengthened to 31s. 6d.

Among textiles, Courtaulds at 55s. 6d. xd were unaffected by the unchanged interim dividend. British Celanese eased to 33s. 6d. Bradford Dyers were 25s. 1½d., Calico Printers 19s. 6d., and Bleachers 14s. Awaiting the interim dividend, Gas Light & Coke were steady at 23s. 4½d. and, in other directions, Low Temperature Carbonisation 2s. ordinary changed hands up to 3s. Following an earlier rise, Amalgamated Metal receded to 20s. 1½d., while Imperial Smelting were 15s. 4½d., and Metal Box shares 91s. 9d. xd, but Murex strengthened to 97s. 6d. Although not holding best prices, Barry & Staines were 54s., and Wall Paper deferred 43s. De La Rue reacted to £10½ xd, Erinoid 5s. ordinary were 11s. 6d., and British Industrial Plastics 2s. ordinary changed hands around 7s. 1½d. The 1s. shares of the Cementation Co. were 5s. 6d. British Aluminium have been steady at 43s., and Crittall Manufacturing at 28s. 3d. were little changed.

Greeff Chemicals Holdings 5s. ordinary firmed up to 9s. 9d. Monsanto Chemicals 5½ per cent. preference were 23s. Johnson Matthey ordinary have changed hands up to 55s. Dividend on the last-named was recently raised from 10 to 12 per cent. Blythe Colour 4s. ordinary were again 20s. Boots Drug showed small fluctuations around 56s. 9d., Timothy Whites were 41s. 9d., and Sangers 5s. ordinary were steady at 31s. on the unchanged 25 per cent. dividend. Oil shares became easier, but Anglo-Iranian were favoured and rose to £5½.

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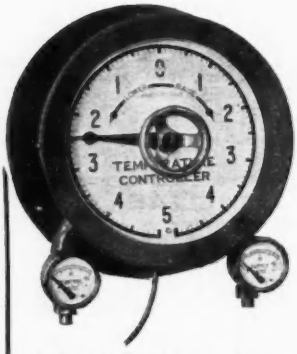

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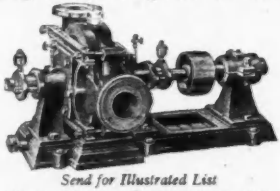

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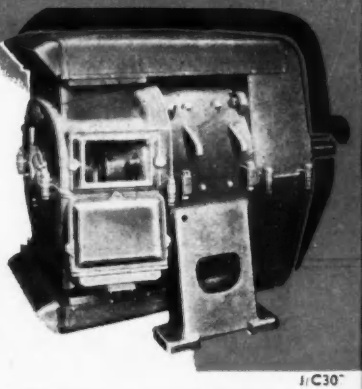

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